



Instruction Manual

TopClean AS

*Hygienic, Self-priming
Liquid Ring Pumps*

CE – Declaration of conformity

Manufacturer

Johnson Pump
Box 1436
SE- 701 14 Örebro
Sweden

We declare under our sole responsibility that the product:

Pump Series AS

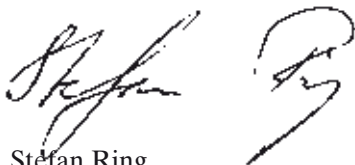
CE declaration of conformity (Ann.II.A, 98/37/EEC)

to which this declaration refers, is conform to safety requirements according to 98/37/EEC norms and amendments

Manufacturer declaration (Ann. II.B, 98/37/EEC)

cannot be operated before the machine in which is assembled, will be declared in conformity with safety requirements according to 98/37/EEC norms and amendments.

Örebro, Sweden, 01/03/2007

A handwritten signature in black ink, appearing to read 'Stefan Ring', with a large, stylized initial 'R' to its right.

Stefan Ring
Manager Quality & Environment

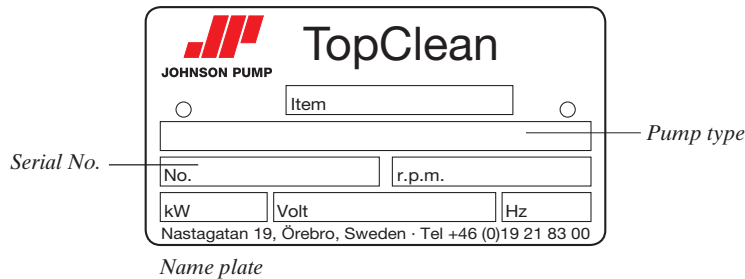
Index

1.0	Introduction	3
2.0	Symbols	3
3.0	Safety warnings	3
4.0	Transportation, receipt and transferring of goods	4
4.1	Transportation	4
4.2	Receipt	4
4.3	Transferring	4
5.0	Description	5
5.1	Sound pressure level	5
6.0	Non-permitted uses	6
7.0	Installation	6
7.1	Suction and inflow conditions	6
7.2	Piping	6
7.3	Electrical connection	7
8.0	Operation	7
8.1	Preliminary operations and starting	7
8.2	Operating checks	8
8.3	Extended stop	8
8.4	Cleaning the pump	8
9.0	Spare parts	8
10.0	Seals	9
11.0	Disassembly and Assembly AS-series	10
11.1	General instructions	10
11.2	O-rings and lip seals	10
11.3	Shutdown	10
11.4	Disassembly	11
11.4.1	Removal of pump casing and impeller – AS 40, 50, 60, 65 and 80	11
11.4.2	Removal of pump casing and impeller – AS 42 and AS 52	11
11.4.3	Seal disassembly	12
11.4.3.1	T execution	12
11.4.3.2	V execution	12
11.4.3.3	Q execution	12
11.4.4	Bearing removal	13
11.5	Assembly	13
11.5.1	Clearances	13
11.5.2	Pump assembly AS 40, 50, 60, 65	14
11.5.3	Seal assembly	14

	11.5.3.1	T execution	14
	11.5.3.2	V execution	14
	11.5.3.3	Q execution	15
	11.5.4	Assembly of pump casing and impeller assembly	
		– AS 40, AS 50, AS 60, AS 65 and AS 80	15
	11.5.5	Pump cover and Impeller assembly – AS 42 and AS 52	16
12.0		Spare parts lists and sectional drawings	17
12.1		Spare part list AS 40, 50, 60-65, 80	17
12.2		AS 40 – Execution T, Q, V	18
12.3		AS 50 – Execution T, Q, V	19
12.4		AS 60-65 – Execution T, Q, V	20
12.5		AS 80 – Execution T, Q, V	21
12.6		Spare part list AS 42, 52	22
12.7		AS 42 – Execution T, Q, V	23
12.8		AS 52 – Execution T, Q, V	24
13.0		Dimensions and weights	25
13.1		AS 40-50-60-65-80 with shroud 1450 rpm	25
13.2		AS 40-50-60-65-80 without shroud 1450 rpm	25
13.3		AS 42-52 with shroud 1450 rpm	26
13.4		AS 42-52 with shroud 1450 rpm	26
14.0		Trouble shooting chart	27
15.0		Disposal of the pump	28

1.0 Introduction

- Read the instructions carefully and keep them for future consultation.
- Johnson Pump reserves the right to make any changes to the documentation it deems necessary without being obliged to update publications that have already been issued.
- When requesting information, spare parts or assistance, always specify the pump type and serial number in order to ensure fast and efficient service: the complete code is given on the plate and in the purchase documents.



2.0 Symbols

	Warning: Pay great attention to the text parts indicated by this symbol.
	Danger: The non-observance of instructions can cause serious damage to persons and/or objects.
	Danger: Only skilled personnel is allowed to carry out operations concerning the electric parts.

3.0 Safety warnings

When the pump is working the following occurs:



- Electric parts are in tension.
- Mechanical parts are moving.
- Pump body, pipelines and articulations are under internal pressure. Therefore do not remove any protection or locking, do not loosen screws or clampings, as this can cause serious damages to persons or objects. The clamp joining the pump casing and the cover must be well tightened and it should not be easily unscrewed by hand. The tightening of the clamp must be carried out by means of a key and **not** by hand.
- Non-observance of inspection and maintenance can cause damages to persons and objects, especially when dangerous or toxic liquids are pumped.
- When pumping liquids at a temperature over 60°C, adequate protection and warning signals are required.
- When you buy a pump with bare shaft, motor coupling operations have to be carried out according to technical directions and law, providing adequate protections for joints, gear belts, etc.



- Operations on the electric parts have to be carried out by skilled personnel, according to technical directions and law, on authorisation of the responsible installer.
- Installation must ensure adequate ventilation, in order to cool the engine, as well as enough space for maintenance operations.

Before carrying out any operation which requires to disassembly of the pump (inspection, cleaning, seal replacement, etc.), the following preliminary operations have to be carried out:

- Switch off engine tension and disinsert electric connection.
- Close valves on suction and outlet pipelines, in order to avoid the risk of inundation.
- Use adequate protection for hands and face, if the pump contains liquids which are hazardous to health (for example acids, solvents, etc.).
- Consider whether the liquid which flows out of the pump when disassembling is dangerous and arrange for adequate safety measures.

4.0 Transportation, receipt and transferring of goods

4.1 Transportation

The packings of all AS pumps are defined when making the order. Unless prior arrangements are given, goods will be packed only for transit conditions and not for long-term storage; in case it should be necessary to store the pumps outside, you are requested to cover the pumps appropriately in order to protect the electrical parts (motor) from rain, dust, humidity etc.

4.2 Receipt



Upon receipt of goods the integrity of the packaging must be verified in order to identify possible damages to the content during transfer, and to claim immediately from the carrier. Should any damage be ascertained, the following procedure must be observed:

- Collect the goods with receipt.
- Take the necessary pictures showing the damages.
- Notify the carrier of the suffered damages, by registered airmail – including the pictures taken.

4.3 Transferring

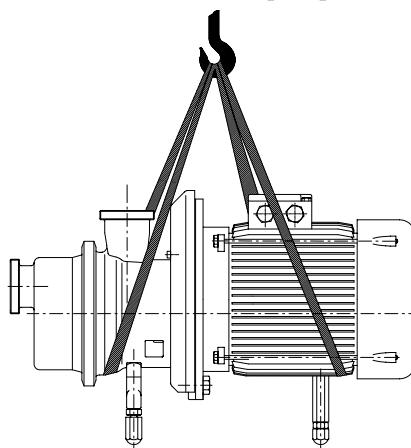


Carry the packed pumps as close as possible to the place of installation by means of appropriate lifting devices and unpack them. During this operation take care, as unsteady parts could fall down.

The material used for packing (wood, paper, cellophane, etc.) should be properly disposed of, according to the corresponding rules in force in receiver's country.

After unpacking the pump, use special lifting belts and move the pump-motor-set to the place of installation; never use the eyebolts on the motor to move the pump, as the eyebolts are for moving the motor only.

In versions complete with shroud, take the shroud off before moving the pump-motor-set, in order to avoid damages.



5.0 Description

The pumps of series AS are centrifugal side channel self-priming with star-shaped impeller; the ports are located on the longitudinal axe with the suction located on the front of the pump cover. All models have threaded connections for fittings according to DIN 11851 standard (unless otherwise requested). The pump front cover is easy to open to improve cleaning and inspection operations; all models are fitted with mechanical seals and the materials used for the components of mechanical seal are chosen according to the liquid to be pumped.

Designed in close-coupled version, fitted with independant standard electric motors B5 shape, IP 55 protection (unless otherwise requested).

These pumps are designed for applications where the liquid to be pumped :

- is not subject to pollution of any kind,
- is at a temperature between -30°C and +140°C,
- must under no circumstances come into contact with the outside environment,
- is chemically aggressive.

5.1 Sound pressure level

The sound pressure level of self-priming pumps is the following (see table):

The measurement has been made by means of a phon-meter placed at 1 m distance from the pump and at a height of 1.6 m from the ground.

Preliminary condition is that the pump is fixed correctly; the above mentioned values do not take into account external noise sources (e.g. valves, abrupt hydraulic deflections).

Pump type	dB(A)
AS 40	< 80
AS 42	81-85
AS 50	81-85
AS 52	86-90
AS 60	86-90
AS 65	86-90
AS 80	86-90

6.0 Non-permitted uses

Do not use the pump with a suction pressure greater than the specified value (0.5 times the discharge head generated by the pump).

The pump must always be used in an environment appropriate to the level of protection of the motor. Always check this on the motor plate before installation.



The pump may not be used in environments which require a higher level of protection or a higher specification motor or electrical parts.

Components complying with the safety standards for the environment in question must be used.

7.0 Installation

7.1 Suction and inflow conditions

(NPSH = Net Positive Suction Head)

NPSH of system (available NPSH)

In order to ensure that pump operation is free from cavitation, it is essential to observe the maximum permitted suction lift **ha geo max** or the minimum allowable head **hc geo min**. **NPSH of pump** (required NPSH)

The centrifugal pumps can operate correctly only if vapour has not formed inside. For this reason the static head at the reference point for the NPSH is the centre of the impeller, that is the point of intersection of the pump shaft axis with the vertical plane that passes through the external points of the blade inlet corners.

NPSH_{nec.} is the value required by the pump, expressed in metres, obtained from the performance curve. In practice 0.5 m should be added to this value as a safety margin.

7.2 Piping

In order to prevent the creation of harmful stresses, the suction and discharge pipes must be connected to the pump ports without the use of force. These pipes must also be supported independently avoiding causing stresses on the pump. The internal diameter must be the same size as the pump connections. It must in any case not be smaller to avoid head loss and/or poor performances. Always use elbows with large radius. If the pipe diameter changes along the line, use reduction cones, choosing the ones that are most suitable for avoiding the formation of air pockets (Fig. 1).

The suction pipe must be as short as possible and rise as it moves towards the pump if it is sucking from a tank, if on the other hand the pump is below the level of the liquid, the pipe should descend slightly. If the pump is used for transporting hot liquids, fit expansion joints to compensate any expansion of the piping. The maximum velocity of the liquid in the suction pipe must not be greater than 3 m/s. Velocities between 1 and 2 m/s are recommended.

The suction pipe must be designed in such a way as to prevent air from entering the pump. For this reason, when sucking from a tank located at a lower level, the pipe must reach below the free surface of the liquid. Avoid creating obstacles which could increase suction losses disrupting smooth fluid flow. Make sure that there are no restrictions,



Fig. 1

7.3 Electrical connection



Make the electrical connection only after the hydraulic connection has been completed; set up the motor control system in conformity with the technical standards and regulations in force (EN 60204-1); in particular a manual electric power switch must be installed with adequate current switching capacity; devices for overcurrent and overload protection (e.g. fuses, automatic switches, etc.) must also be fitted, plus, if necessary, a device to prevent accidental restarting.

Check that the main frequency and voltage and the available power are suitable for the motor installed. All the material used for the electrical connection (cables, cable clamps, switches and shielding) must have a suitable level of protection for the environment in which it is installed. Be sure to use cables of sufficient cross-section for the current shown on the motor plate so as to prevent them from overheating. Before doing anything else, make the motor's earth connection, using the terminal on the motor and a cable of sufficient cross-section. The cables may be connected to the terminal board using either a delta or star arrangement. Follow the data given on the motor plate for the main voltage, as shown in the diagram in fig 2; ensure that the terminals are clean and tight and not under stress.

When starting, the motor's current absorption increases briefly to 5-6 times the nominal value. If the mains supply is unable to sustain this increase in absorption, use a star-delta starter or other kind of device (e.g. an autotransformer).

Johnson Pump will accept no responsibility for damage to property and/or injury to persons caused by failure to comply with technical standards and regulations in force.

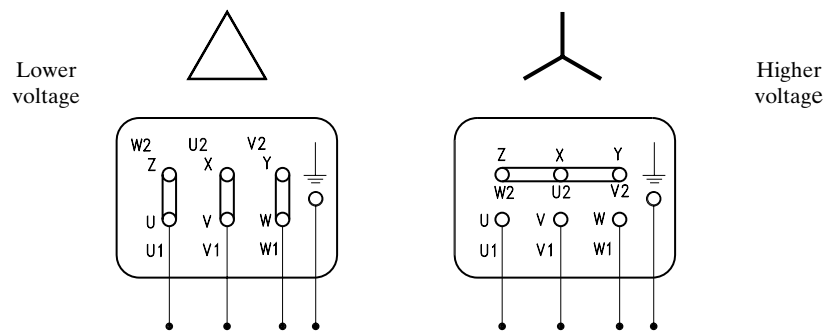


Fig 2

8.0 Operation

8.1 Preliminary operations and starting


When first starting, fill the pump with liquid so as to create the pressure drop required for suction. When starting subsequently the quantity of liquid that remains in the pump will be sufficient to ensure self-priming even if the pipe is empty. Make sure that the pump does not become completely empty in the event of installation under a vacuum or to a siphon. If necessary, fit a check valve.

- Check that the pump turns freely under hand pressure.



- Check that the clamp joining the pump casing and the cover is well tightened and that it cannot be easily unscrewed by hand. The tightening of the clamp must be carried out by means of a key and **not** by hand.
- Check that the pump turns in the marked direction.
- Check that any gate valves installed on the suction and discharge pipelines are open.
- Start the pump and check the turns direction; before restarting it is extremely important to

8.2 Operating checks

- If the pump does not generate the required discharge head rapidly, facilitate priming by stopping the pump and adding liquid.
- Check that the absorption of the motor does not exceed the value specified on the plate.
- The pump must always work smoothly and without vibrations.
- Do not operate without liquid and in any case avoid prolonged operation with the discharge gate valve closed.
-  **With series AS pumps never close discharge side completely.**
- Mechanical seal: check that there is no leakage along the shaft.

8.3 Extended stop

When stopping the pump for a longer time, empty the pump completely and wash it accurately in order to avoid the formation of scales and/or encrustations. When starting the pump again, please follow the above mentioned instructions.

8.4 Cleaning the pump

The pump does not require any special washing procedures. The washing cycles normally used for the plant in which it is installed are quite satisfactory. When using the pump for liquids that tend to harden or crystallize, always make sure it is washed before periods when the machine is to be taken out of operation. This will ensure durability of the seal and of the pump itself.

It is the user's responsibility to ensure that the washing liquids are compatible with the process liquid and the pump.

9.0 Spare parts

Denomination	Number of pumps (Including reserve)				
	1	2	3	4	5
Mechanical seal	1	2	3	4	4
Pump bearing	1	1	1	2	2
O-ring seal	2	3	5	6	7
O-ring seal nut	2	3	5	6	7
Recommended spare part for two years of operation according to the number of pumps installed – vdma standard					

Johnson Pump declines all responsibility for damage or injury resulting from the use of non-original spare parts

10.0 Seals

All centrifugal pumps of the AS series are fitted with unified mechanical seals according to DIN 24960 - ISO 3069 standards, in order to grant the interchangeability (subject to verification of axial space). The type of mechanical seal and material are chosen according to the liquid to be pumped.

Mechanical seal types conforming to DIN 24960

- T execution: Standard – Internal single mechanical seal
- V execution: External single mechanical seal with external flushing/quench.
- Q execution: Compact double mechanical seal back-to-back, high pressure flush



Warning: before using the pump for any liquids other than those specified when selecting and ordering, ensure that mechanical seals and gaskets are suitable for the new product.

11.0 Disassembly and Assembly AS-series

11.1 General instructions

Assembly and disassembly may be preformed by qualified personnel only. Always wear appropriate safety clothing. Make sure that personnel are instructed and educated.

Insufficient or wrong assembly and disassembly can lead to the pump malfunction. Johnson Pump is not liable for accidents and/or damage caused by non-compliance with the guidelines.

Always work in a clean surrounding. Keep all highly sensitive parts such as seals, O-rings, bearings, etc. in their original packing as long as possible.

Use a clean work surface.

Check that the parts to be used have not been damaged during transport.

Never work on the pump in operation. In case of a disassembled pump, avoid any contact with the impeller when turning the shaft manually.

Do not forget that the pump can be started even when the pump casing has been removed for e.g. cleaning. Never run the pump without the pump casing. Follow the instructions for shutdown before performing any maintenance or service.

After disassembly carefully clean the parts and check them for damage, especially the mounting surfaces, and replace all damaged parts.

All parts fitted together at the disassembly must stay together when reinstalled, especially the impeller, shaft, shim and back plate.

11.2 O-rings and lip seals

When working with lip seals or O-rings, take care not to damage them as they pass over sharp edges of splines, threads, etc. Be sure that the O-rings are not twisted in the groove when installing.

All O-rings and sealing lips should be lubricated with a suitable lubricant before fitting, e.g. soap and water or silicone spray.

For O-rings made of PTFE, it is advised to heat them up in hot water before placement. A warmed up O-ring becomes softer, thus easier to install. Be aware of that PTFE has no thermal memory.

11.3 Shutdown

Before starting the maintenance or inspection, follow the next steps to shut down the pump.

1. Stop the pump. To prevent the motor from starting while you are working on the pump follow the procedure below:
 - Turn off the pump at the electrical cabinet.
 - Set the pump circuit breaker to off.
 - Switch off and lock the operating switch.
 - Remove the fuse.
 - Sign the electrical cabinet “danger”.
2. Remove, if necessary, the protection around the shaft coupling when the pump has stopped completely.
3. Let the pump cool down to ambient temperature.

4. Isolate and depressurize flushing/quench system.
5. Close the inlet and discharge valves.
6. Drain and purge the pump casing and pipe work.
7. Clean the pump externally before disassembly.

11.4 Disassembly

11.4.1 Removal of pump casing and impeller – AS 40, 50, 60, 65 and 80

See sectional drawings AS40 page 18, AS 50 page 19

1. Remove the mechanical seal flushing pipes 71 on V and Q executions.
2. Remove the shroud (44) with screws (46) (if shroud is assembled).
3. Loosen screws (28) to remove the motor (50).
4. Gently pull the motor (50) away from the bearing housing (5).
5. Motor sizes up to IEC 112. If necessary remove the adjustable foot frame by loosening the two nuts (30) and the screws (29).
6. Motor sizes larger than IEC 112. If necessary remove the adjustable foot frame by loosening the screws (29) to remove the front foot (20), and the rear foots (23).
7. Loosen and remove the casing clamp (9).
8. Remove the casing cover (2).
9. Unscrew the impeller nut (10) anti-clockwise and slide off the impeller (3).
10. Remove the impeller key (11).
11. Remove the clearance shims (19).

11.4.2 Removal of pump casing and impeller – AS 42 and AS 52

See sectional drawings AS 42 page 23 and AS 52 page 24

1. Remove the mechanical seal flushing pipes 71 on V and Q executions.
2. Remove the shroud (44) with screws (46) (if shroud is assembled).
3. Loosen the screws (28) to remove the motor (50).
4. Gently pull the motor (50) away from the bearing housing (5).
5. Motor sizes up to IEC 112. If necessary remove the adjustable foot frame by loosening the two nuts (30) and the socket head screw (29).
6. Motor sizes larger than IEC 112. If necessary remove the adjustable foot frame by loosening the socket head screw (29) to remove front foot (20), and the rear foots (23).
7. Loosen and remove the rag bolt (38).
8. Remove the casing cover (2).
9. Remove the first impeller (3) as well as the impeller key (11).
10. Remove the inter-discharge casing (35) and the intersuction casing (34).
11. Remove the second impeller (3) as well as the impeller key (11).

11.4.3 Seal disassembly

11.4.3.1 T execution

1. **AS 42 and AS 52 only.** Push back the ring retainer (31) to remove the circlip (32) from the shaft (4).
2. Remove the rotating seal half by turning the spring clockwise and at the same time pull the spring and the seal over the shaft end. If necessary use a pair of pliers.
3. Loosen the screws (26).
4. Slowly remove the pump casing (1) from the bearing housing (5).
5. Remove the stationary seal part from its seat in the pump casing (1). Pull off the thrower (14).

11.4.3.2 V execution

1. **AS 42 and AS 52 only.** Push back the ring retainer (31) to remove the circlip (32) from the shaft (4).
2. Remove the rotating seal half by turning the spring clockwise and at the same time pull the spring and the seal over the shaft end. If necessary use a pair of pliers.
3. Loosen the screws (26).
4. Slowly remove the pump casing (1) from the bearing housing (5).
5. Loosen the stud bolt (68)
6. Gently pull off the mechanical seal cover (65) from the pump casing (1).
7. Remove the radial seal (66) from the mechanical seal cover (65)

11.4.3.3 Q execution

1. **AS 40, 42, 60-65, 80** Loosen and remove the stud bolts (68)
AS 50, 52 on the stud bolts (62).
1. Separate the mechanical seal cover (60) from the pump casing (1) by pushing it backwards.
2. Loosen the screws (26).
3. Pull the pump casing (1) gently from the bearing housing (5).
4. Remove the primary stationary seal from the rear of the pump casing (1).
5. Loosen the grub screws on the rotating seal
6. Slide off the rotating seals along the shaft (4).
7. Remove the mechanical seal cover (60) by gently pulling it over the shaft (4).
8. Push out the secondary stationary seal from the mechanical seal cover (60).
9. Remove the O-ring (61).
10. Pull off the thrower (14).

11.4.4 Bearing removal

1. Remove shroud adapter (43) (if assembled) by loosening the screws (45).
2. Unscrew the screws (27).
3. Remove the bearing cover (8).
4. Press out the shaft and bearing assembly from the bearing housing (5).
5. Unscrew the ring nut (17).
Press out the shaft (4) from the bearing (7).

11.5 Assembly

Remark: It is recommended to pre-assemble the pump without the seal. Shim the pump according to the clearance table to obtain the correct impeller clearance, and thereafter assemble the pump with seal.

Exception: AS 42 and AS 52 (two stage pumps) which have floating impellers (shim free).

11.5.1 Clearances

Defined clearances for AS – range to be shimmed

- A= Behind impeller, Clearance between Impeller and Pump casing
- B= Front of impeller, Clearance between Impeller and Cover
- C= Clearance between, Pump Casing and Cover

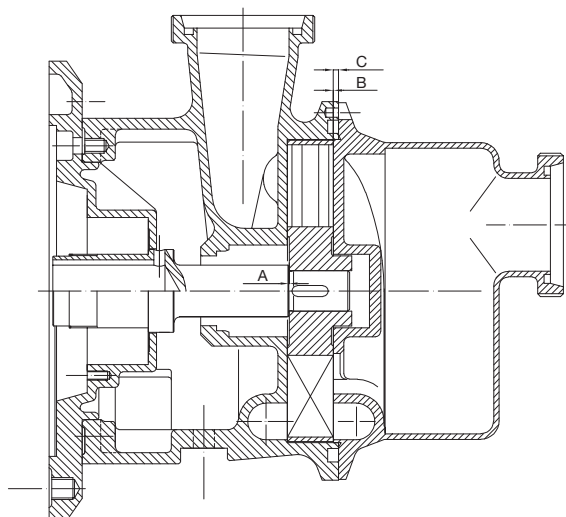
To remember:

C clearance is machined, B will be given depending on the shims put under A, Behind impeller, should be correct

If problems occur concentrate on the A clearance it is the most important, if there will be a deviation make sure that it will be at B clearance

If it is other problems please contact Johnson pump or dealer for advice.

Pump clearances defined and shimmed			
AS pumps	A	B	C
AS 40	0.15	15	
AS 50	0.15	0.15	2.85
AS60-65	0.2	0.2	2.80
AS 80	0.3	0.3	4.20



11.5.2 Pump assembly AS 40, 50, 60, 65

Before assembly read chapters 11.1 General Instructions and 11.2 O-rings and lip seals.

N.B. *Make sure that all surfaces are clean and without damage. If necessary polish using (600 degrees) emery cloth, lubricate all O-rings and contact surfaces with soap and water or silicone spray.*

1. Check the shaft condition – no tracks of wear etc. Clean it carefully.
2. Press the bearings (7) on to the shaft (4).
3. Assemble the ring nut (17) and tighten it.
4. Press the shaft (4) and bearing assembly into the bearing housing (5).
5. Assemble the bearing cover (8). Tighten it with the screws (27).
6. Push the thrower (14) on the shaft (4).
7. Assemble the shroud adapter (43) (if shroud should be assembled) with screws (46).

11.5.3 Seal assembly

11.5.3.1 T execution

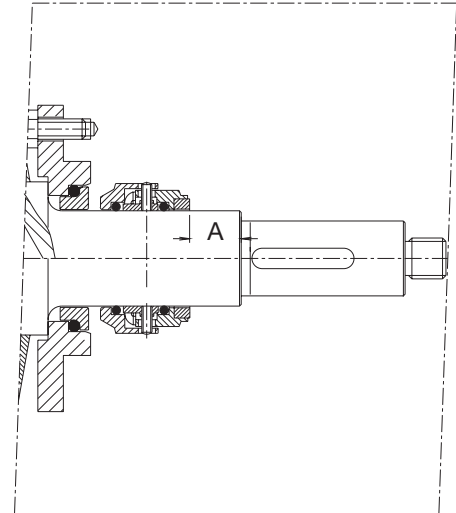
1. Insert the stationary seal part into the pump casing (1) by gently pushing it.
2. Assemble the pump casing (1) together with the bearing housing (5). Be careful with the seal when sliding it over the shaft. Tighten the pump casing with the screws (26).
3. Fit the rotating part of the seal on the shaft (4).
4. **N.B.** Assemble the mechanical seal carefully to avoid damages on the seal faces and O-rings..
5. **AS 42 and AS 52 only.** Fit the ring retainer (31) on the shaft (4). Compress the spring on the rotating seal with the ring retainer and lock it with the circlip (32).

11.5.3.2 V execution

1. Press the radial seal (66) into the mechanical seal cover (65).
 2. Fasten the stud bolt (68) on the pump casing (1).
 3. Slide the mechanical seal cover (65) on the stud bolts (68) and tighten them.
 4. Insert the stationary seal part into the pump casing (1) by gently pushing it.
 5. Assemble the pump casing (1) together with the bearing housing (5). Be careful not to damage the radial seal (66). Tighten the pump casing with screws (26).
 6. Fit the rotating part of the seal on the shaft (4).
- N.B.** *Assemble the mechanical seal carefully to avoid damages on the seal faces and O-rings.*
7. **AS 42 and AS 52 only.** Fit the ring retainer (31) on the shaft (4). Compress the spring on the rotating seal with the ring retainer and lock it with the circlip (32).

11.5.3.3 Q execution

1. Position the O-ring (61) on the mechanical seal cover (60).
2. Position the secondary stationary seal in the mechanical seal cover (60) and hex-head screws (62).
3. Slide the mechanical seal cover (60) onto the shaft (4) and position it on the back end of the shaft.
4. Gently slide the rotating seals onto the shaft (4).
5. Check the “A” length as it is essential for an equal working load on both seal faces, A measures as follows:
 - AS 40 = 16.0mm
 - AS 50 = 17.5mm
 - AS 60 = 15.5mm
 - AS 65 = 15.5mm
 - AS 80 = 19.5 mm
6. Tighten the grub screws on the rotating seal.
7. Fit the primary stationary seal part in the back of the pump casing (1).
8. Assemble the pump casing (1) onto the bearing housing (5). Be careful not to damage the seal. Tighten with the screws (26).
9. Fit the mechanical seal cover (60) together with the pump casing (1) and lock it with the (62).



11.5.4 Assembly of pump casing and impeller assembly – AS 40, AS 50, AS 60, AS 65 and AS 80

1. Fit the correct clearance shims (19) (adjusted from pre-fitting)
2. Fit the impeller key (11) and push on the impeller (3).
3. Fit the O-ring (16) in the impeller nut (10) and tighten the impeller (3).
4. Assemble the O-ring (13) in the pump casing (1) groove.
5. Assemble the cover casing (2) and lock it with the casing clamp (9).
6. **Motors up to size IEC 112.** Fit the adjustable foot frame and lock it with the nuts (30) and the screws (29).
7. **Motor sizes larger than IEC 112.** Fit the adjustable foot frame and fasten the screws (29) for the front foot (20) and the rear feet (23).
8. Assemble the motor (50) by entering the motor shaft into the pump shaft (4) and lock it with the screws (28).
9. Slide the shroud (44) over the motor (50) and assemble it on the adapter (43) with the screws (46)
10. **“V” and “Q” executions.** Assemble the mechanical seal flushing pipes (71 and 71 respectively) on the mechanical seal cover (65 and 60 respectively).

11.5.5 Pump cover and Impeller assembly – AS 42 and AS 52

See drawing

1. Fit the first impeller key (11) and push on the impeller (3) on the shaft (4).
2. Fit the O-ring in the pump casing (1) groove and assemble the inter-suction casing (34).
3. Fit the O-ring (36) in the inter-suction casing (34) and assemble the inter-discharge casing (35).
4. Fit the second impeller key (11) and push on the impeller (3) on the shaft (4)
5. Fit the O-ring (36) in the inter-discharge casing (35). Assemble the cover casing (2) with the rag bolts (38).
6. Motors up to size IEC 112. Fit the adjustable foot frame and lock it with the nuts (30) and the screws (29).
7. Motor sizes larger than IEC 112 or. Fit the adjustable foot frame and fasten the screws (29) for the front foot (20) and the rear foots (23).
8. Assemble the motor (50) by entering the motor shaft into the pump shaft (4) and lock it with the screws (28)
9. Slide the shroud (44) over the motor (50) and assemble it on the adapter (43) with the screws (46)
10. **“V” and “Q” executions.** Assemble the mechanical seal flushing pipes (71 and 71 respectively) on the mechanical seal cover (65 and 60 respectively).

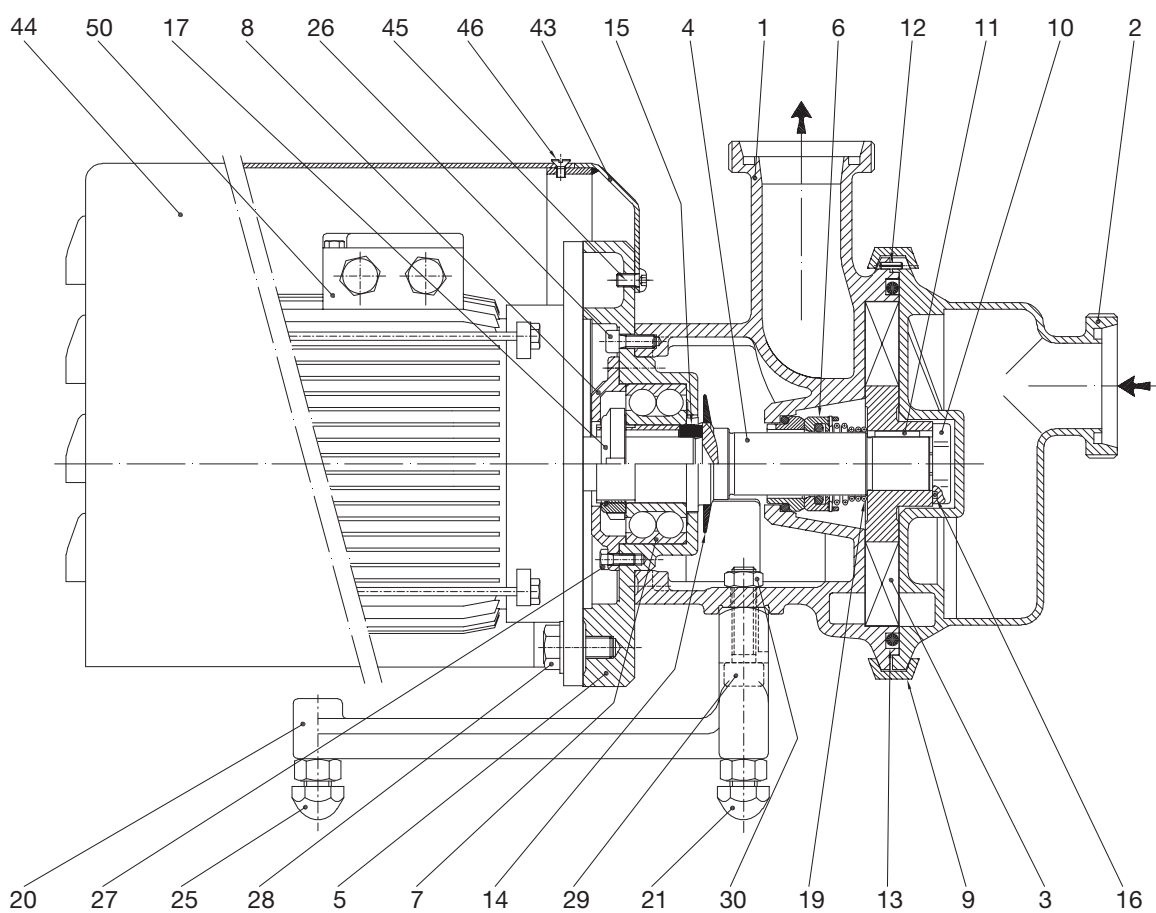
12.0 Spare parts lists and sectional drawings

12.1 Spare part list AS 40, 50, 60-65, 80

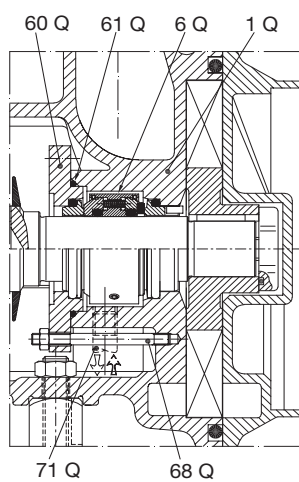
Pos	Qty	Description	Material
1	1	Casing, pump	CF-3M / 1.4409
1 Q	1	Casing, pump Q-execution	CF-3M / 1.4409
1 V	1	Casing, pump V-execution	CF-3M / 1.4409
2	1	Cover, casing	CF-3M / 1.4409
3	1	Impeller	CF-3M / 1.4409
4	1	Shaft	AISI 316 L / 1.4404
4 V	1	Shaft V-execution	AISI 316 L / 1.4404
5	1	Housing, bearing	Cast iron 25 + 3%Ni
6	1	Mechanical seal	-
6 Q	1	Mechanical seal, Q-execution	-
7	1	Bearing	Steel
8	1	Bearing cover	Aluminum 2011
9	1	Clamp, casing	AISI 304 / 1.4301
10	1	Nut, impeller	AISI 316 L / 1.4404
11	1	Key, impeller	AISI 316 / 1.4401
12	1	Pin	AISI 304 / 1.4301
13	1	O-ring	EPDM
14	1	Thrower	NBR
15	1	Shaft plug	NBR
16	1	O-ring	EPDM
17	1	Nut, ring	Galvanized iron
18	1	Grease nipple	Galvanized iron
19	2	Shim	AISI 316 L / 1.4404
20	1	Foot, front	CF-8 / 1.4308
21	2	Foot, adjustable	AISI 304 / 1.4301
23	1	Foot, rear	CF-8 / 1.4308 - AISI 304 / 1.4301
25	1	Foot, adjustable	AISI 304 / 1.4301
26	4	Screw, socket head	AISI 304 / 1.4301
27	3	Screw, socket head	AISI 304 / 1.4301
28	4	Screw, hex-head	Steel
29	2	Screw, socket head	AISI 304 / 1.4301
30	2	Nut	AISI 304 / 1.4301
33	1	Gaco-ring	NBR
40	2	Lantern guard	AISI 304 / 1.4301
43	1	Shroud, adapter	AISI 304 / 1.4301
44	1	Shroud	AISI 304 / 1.4301
45	3	Screw, hex-hollow	AISI 304 / 1.4301
46	3	Screw, flat head	AISI 304 / 1.4301
50	1	Motor-electric	-
60 Q	1	Mechanical seal cover Q-execution	AISI 304 / 1.4301
61 Q	1	O-ring Q-execution	NBR
62 Q	2	Screw, hex-head Q-execution	AISI 304 / 1.4301
65 V	1	Mechanical seal cover V-execution	AISI 304 / 1.4301
66 V	1	Seal, radial shaft V-execution	-
68 Q	2	Stud bolt Q-execution	AISI 304 / 1.4301
68 V	2	Stud bolt V-execution	AISI 304 / 1.4301
70 V	1	O-ring V-execution	NBR
71 Q	2	Mechanical seal flushing pipe Q-execution	AISI 304 / 1.4301
71 V	2	Mechanical seal flushing pipe V-execution	AISI 304 / 1.4301
85 V	1	Ceramic hardened bush V-execution	AISI 304 / 1.4301
86 V	1	O-ring V-execution	NBR
87 V	3	Dowel V-execution	AISI 304 / 1.4301

12.2 AS 40 – Execution T, Q, V

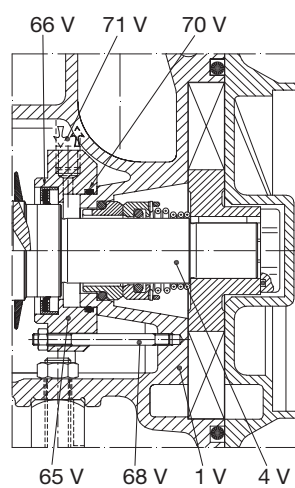
Execution T



Execution Q

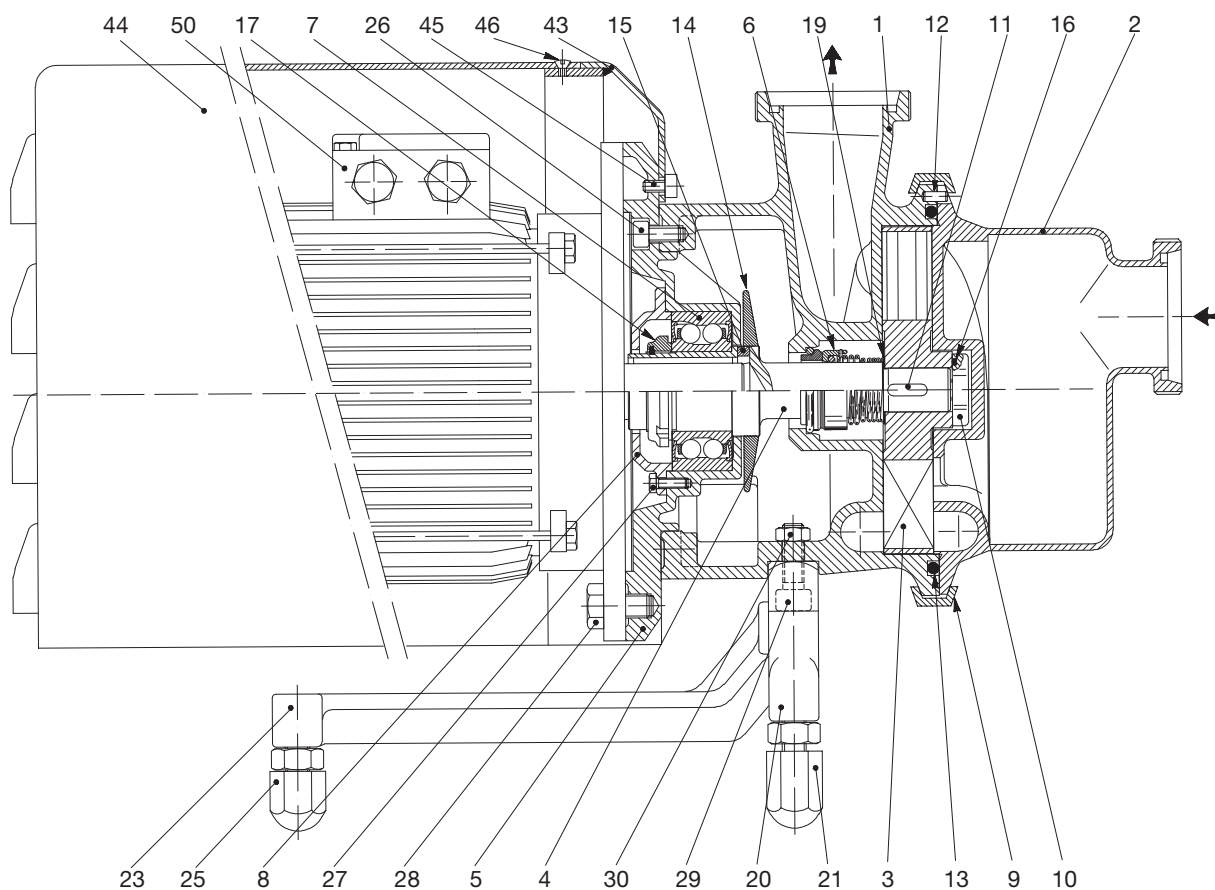


Execution V

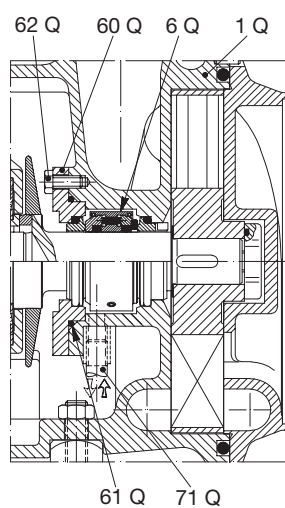


12.3 AS 50 – Execution T, Q, V

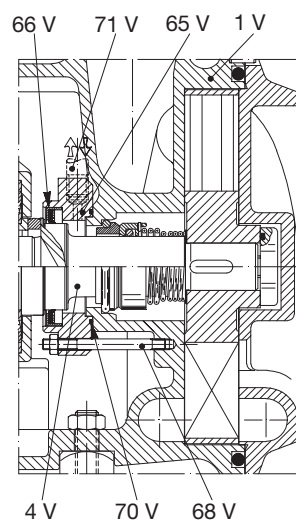
Execution T



Execution Q

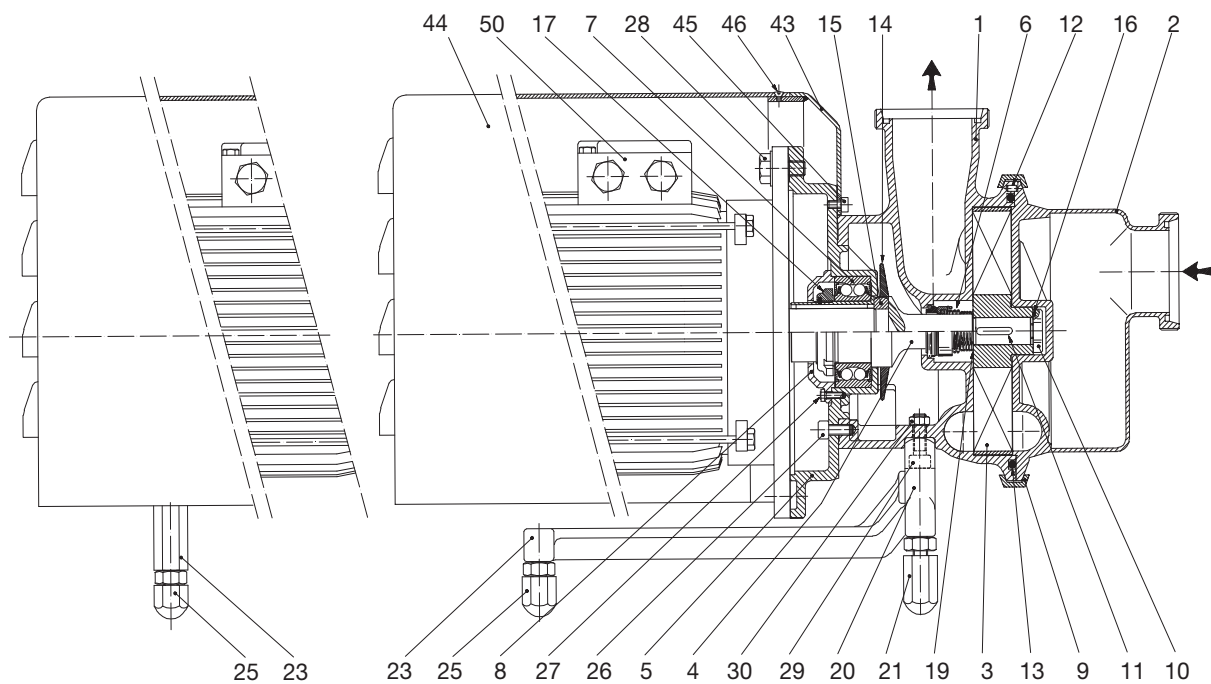


Execution V

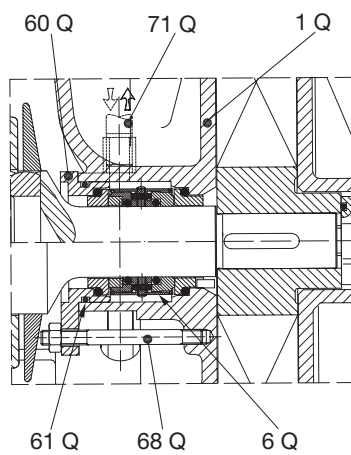


12.4 AS 60-65 – Execution T, Q, V

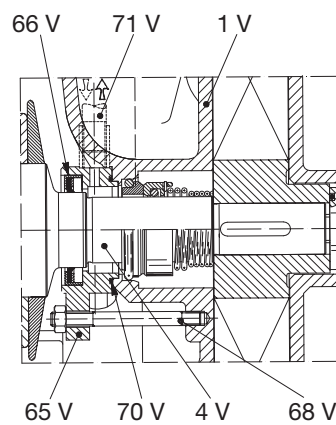
Execution T



Execution Q

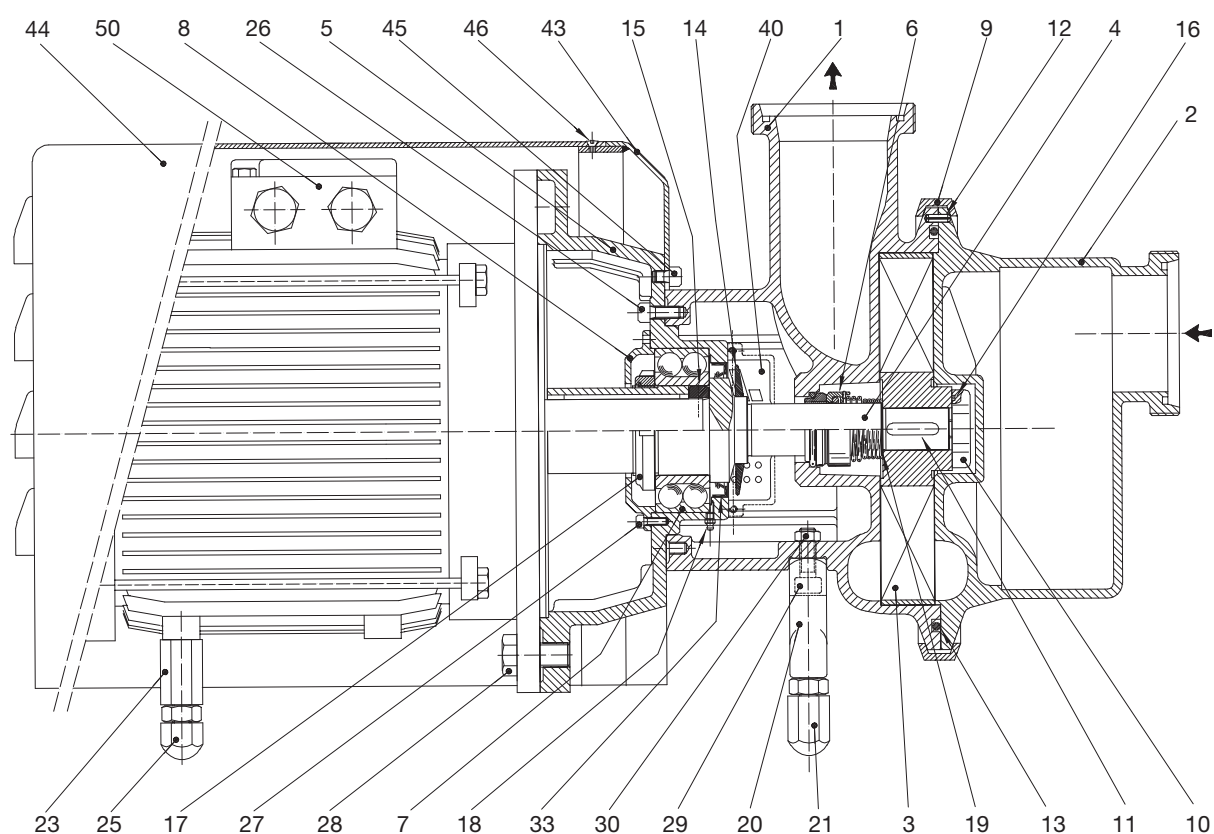


Execution V

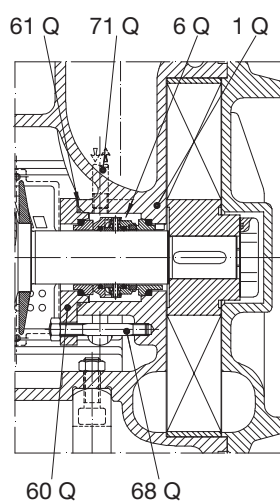


12.5 AS 80 – Execution T, Q, V

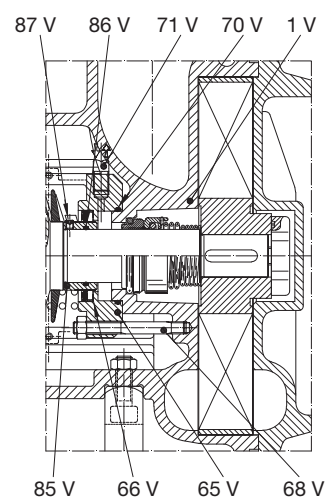
Execution T



Execution Q



Execution V

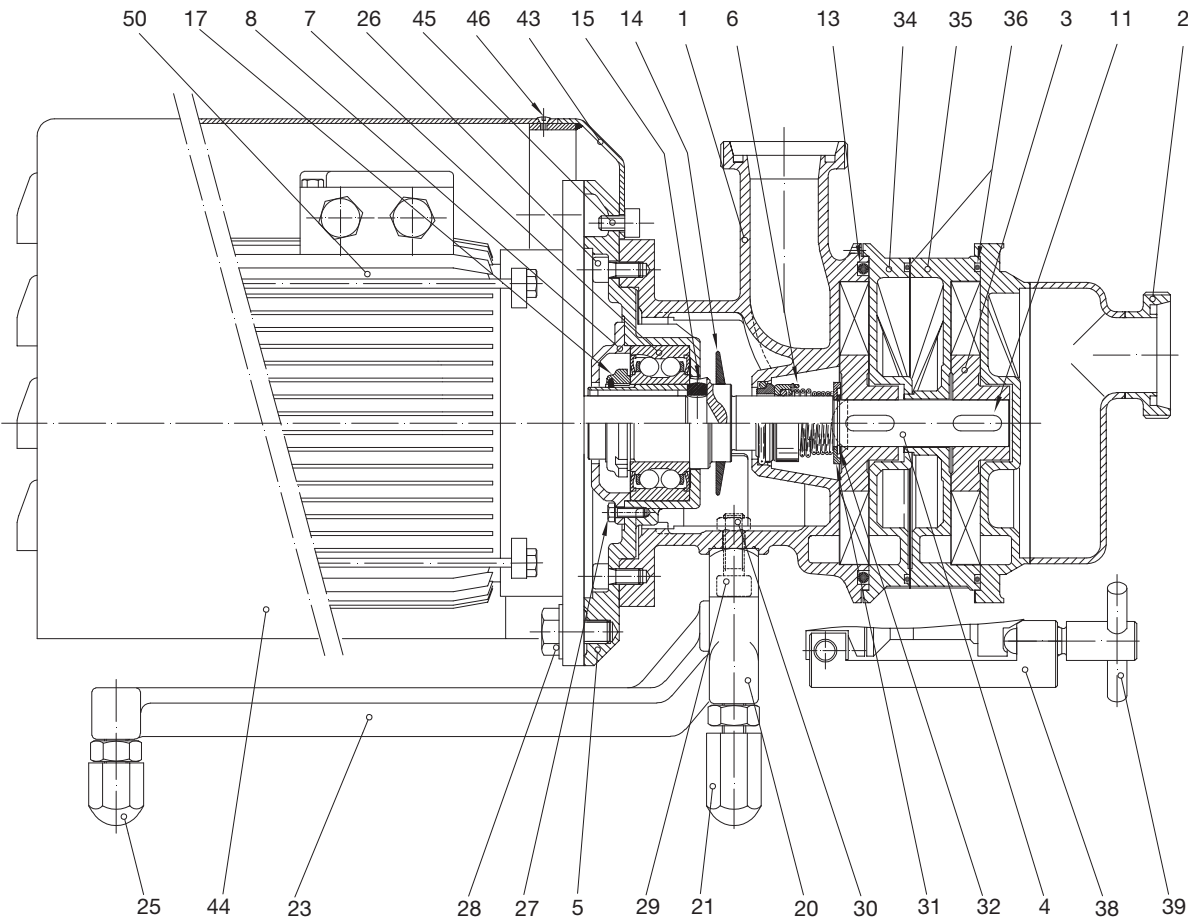


12.6 Spare part list AS 42, 52

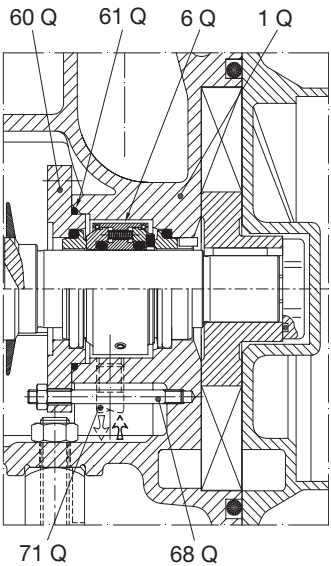
Pos.	Q.ty	Denomination	Material
1	1	Casing, pump	CF-3M / 1.4409
1 Q	1	Casing, pump Q-execution	CF-3M / 1.4409
1 V	1	Casing, pump V-execution	CF-3M / 1.4409
2	1	Cover, casing	CF-3M / 1.4409
3	2	Impeller	CF-3M / 1.4409
4	1	Shaft	AISI 316 L / 1.4404
4 V	1	Shaft V-execution	AISI 316 L / 1.4404
5	1	Housing, bearing	Cast iron 25 + 3%Ni
6	1	Mechanical seal	-
6 Q	1	Mechanical seal, Q-execution	-
7	1	Bearing	Steel
8	1	Bearing cover	Aluminum 2011
11	2	Key, impeller	AISI 316 / 1.4401
13	1	O-ring	EPDM
14	1	Thrower	NBR
15	1	Shaft plug	NBR
17	1	Nut, ring	Galvanized iron
20	1	Foot, front	CF-8 / 1.4308
21	2	Foot, adjustable	AISI 304 / 1.4301
23	1/2	Foot, rear	CF-8 / 1.4308 - AISI 304 / 1.4301
25	1/2	Foot, adjustable	AISI 304 / 1.4301
26	4	Screw, socket head	AISI 304 / 1.4301
27	3	Screw, socket head	AISI 304 / 1.4301
28	4	Screw, hex-head	Steel
29	2	Screw, socket head	AISI 304 / 1.4301
30	2	Nut	AISI 304 / 1.4301
31	1	Ring retainer	AISI 316 L / 1.4404
32	1	Circlip	AISI 304 / 1.4301
34	1	Inter-suction casing	CF-3M / 1.4409
35	1	Inter-discharge casing	CF-3M / 1.4409
36	2	O-ring	EPDM
38	2	Rag bolt	AISI 304 / 1.4301
39	2	Rag bolt pin	AISI 304 / 1.4301
43	1	Shroud, adapter	AISI 304 / 1.4301
44	1	Shroud	AISI 304 / 1.4301
45	3	Screw, hex-hollow	AISI 304 / 1.4301
46	3	Screw, flat head	AISI 304 / 1.4301
50	1	Motor-electric	-
60 Q	1	Mechanical seal cover Q-execution	AISI 304 / 1.4301
61 Q	1	O-ring Q-execution	NBR
62 Q	2	Screw, hex-head Q-execution	AISI 304 / 1.4301
65 V	1	Mechanical seal cover V-execution	AISI 304 / 1.4301
66 V	1	Seal, radial shaft V-execution	-
68 Q	2	Stud bolt Q-execution	AISI 304 / 1.4301
68 V	2	Stud bolt V-execution	AISI 304 / 1.4301
70 V	1	O-ring V-execution	NBR
71 Q	2	Mechanical seal flushing pipe Q-execution	AISI 304 / 1.4301
71 V	2	Mechanical seal flushing pipe V-execution	AISI 304 / 1.4301

12.7 AS 42 – Execution T, Q, V

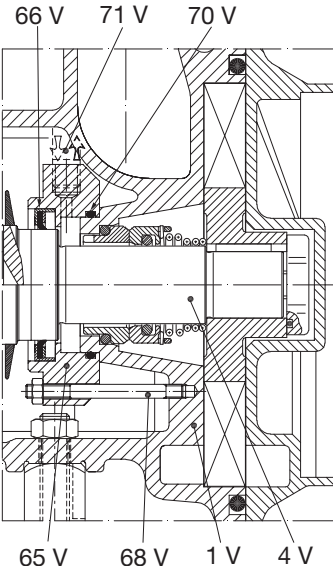
Execution T



Execution Q

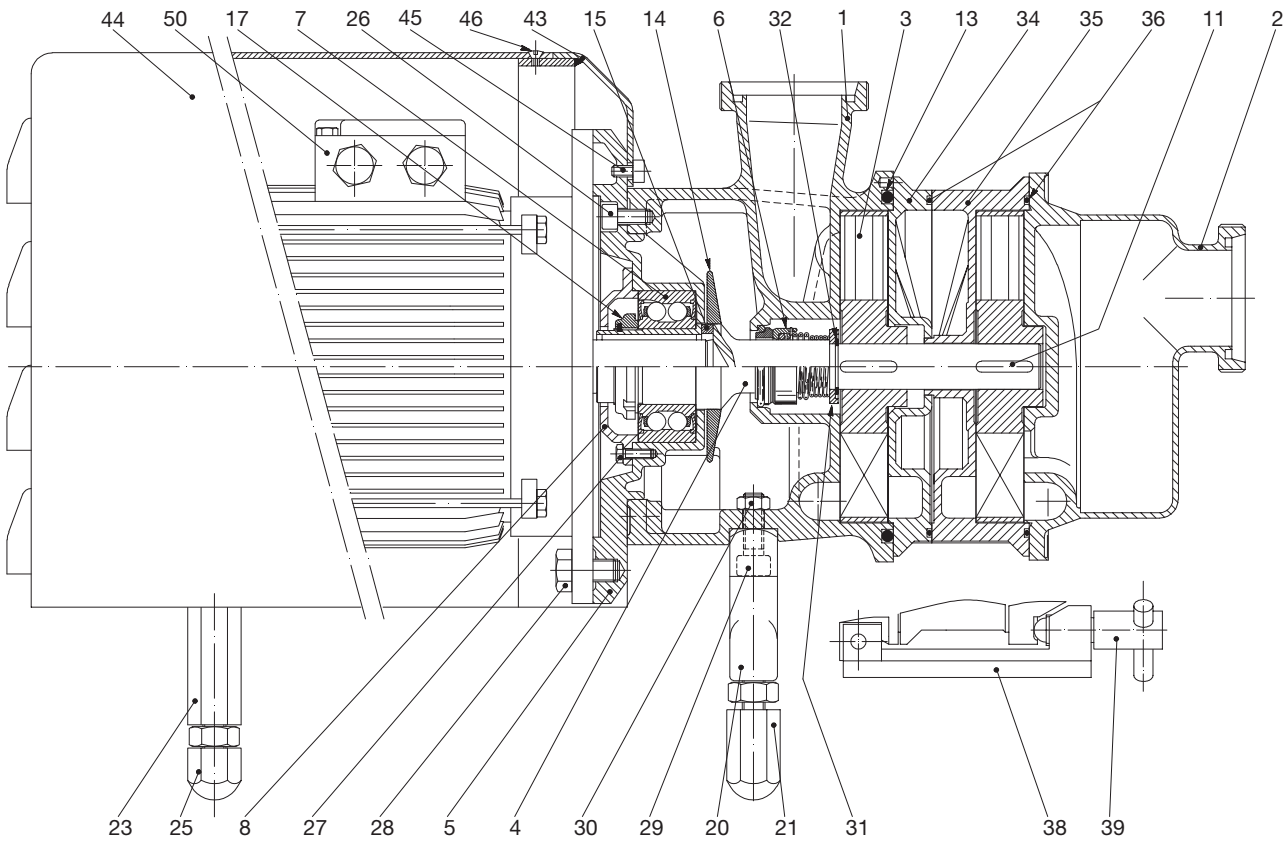


Execution V

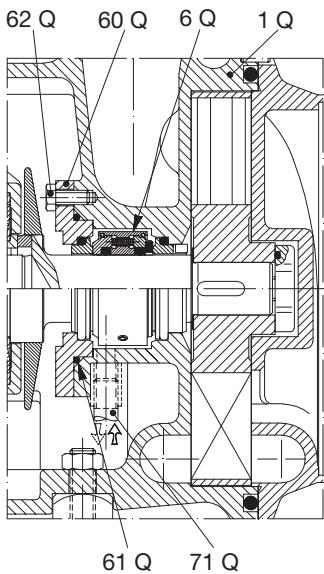


12.8 AS 52 – Execution T, Q, V

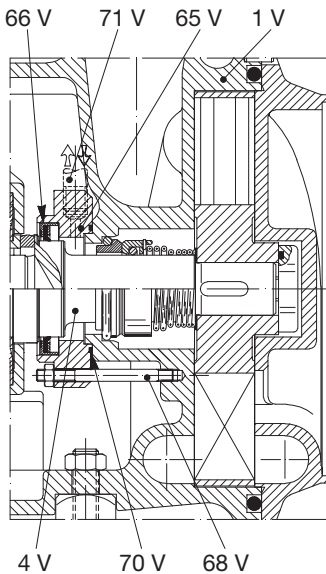
Execution T



Execution Q

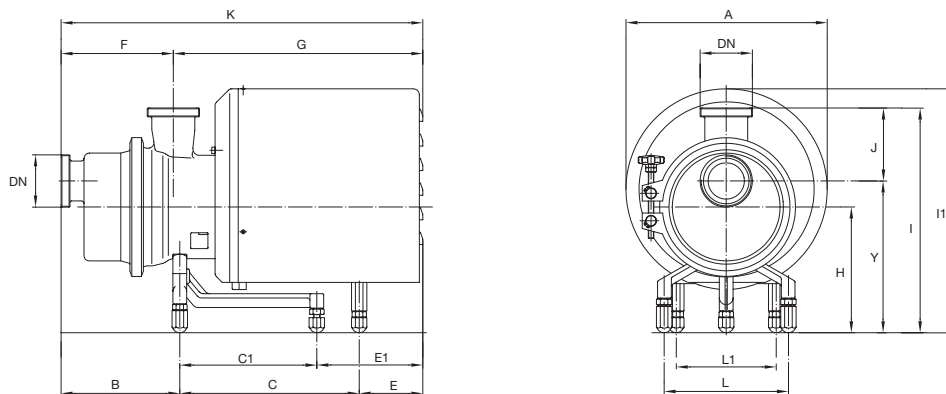


Execution V



13.0 Dimensions and weights

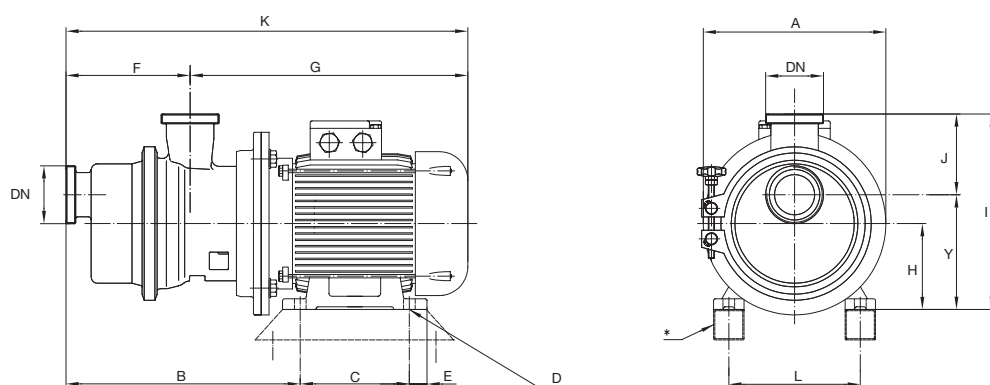
13.1 AS 40-50-60-65-80 with shroud 1450 rpm



Pumps	kW	DN	A	B	C	C1	E	E1	F	G	K	H	J	I	I1	Y	L	L1	Weight kg
AS 40	1,1	40	238	168	-	190	-	222	143	438	581	160	110	305	297	195	178	-	29
	1,5	40	238	168	-	190	-	222	143	438	581	160	110	305	297	195	178	-	31
	2,2	40	298	169	-	301	-	179	143	506	649	190	110	335	354	225	225	-	45
AS 50	2,2	50	298	196	-	301	-	186	175	509	684	213	115	364	377	249	225	-	50
	4	50	298	196	-	301	-	186	175	509	684	213	115	364	377	249	225	-	59
AS 60	4	65	370	216	-	301	-	186	205	499	704	212	135	392	429	257	225	-	62,5
	5,5	65	370	226	324	-	226	-	225	551	776	228	135	408	445	273	225	175	75
AS 65	5,5	65	370	226	324	-	226	-	225	551	776	228	135	408	445	273	225	175	76,5
	7,5	65	370	226	324	-	226	-	225	551	776	228	135	408	445	273	225	175	82,5
AS 80	11	80	360	267	485	-	347	-	248	851	1099	230	158	446	520	288	225	220	129
	15	80	360	267	485	-	347	-	248	851	1099	230	158	446	520	288	225	220	140

Dimensions not binding – DN = DIN 11851 male threaded connection – exec. with standard IEC/EN motors

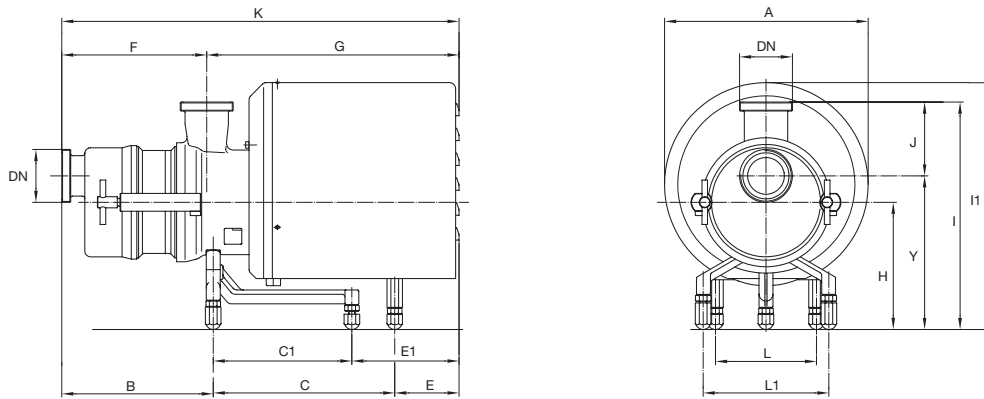
13.2 AS 40-50-60-65-80 without shroud 1450 rpm



Pumps	kW	DN	A	B	C	D	E	F	G	K	H	J	I	Y	L	M	N	O	Weight kg
AS 40	1,1	40	200	296	100	9	22	143	380	523	90	110	235	125	140	-	-	-	26
	1,5	40	200	296	125	9	22	143	380	523	90	110	235	125	140	-	-	-	28
	2,2	40	250	308	140	12	18	143	416	559	100	110	245	135	160	-	-	-	41
AS 50	2,2	50	250	343	140	12	18	175	419	594	100	115	251	136	160	-	-	-	45
	4	50	250	351	140	12	18	175	441	616	112	115	263	148	190	-	-	-	54
AS 60	4	65	250	372	140	12	20	205	431	636	112	134	293	159	190	-	-	-	57
	5,5	65	300	412	140	12	20	204	492	696	132	134	312	179	216	-	-	-	68
AS 65	5,5	65	300	412	140	12	20	204	492	696	132	134	312	179	216	-	-	-	69,5
	7,5	65	300	423	178	12	20	215	492	707	132	134	312	179	216	-	-	-	76
AS 80	11	80	350	555	210	14	23	248	677	925	160	190	376	218	254	-	-	-	118
	15	80	350	555	254	14	23	248	677	925	160	190	376	218	254	-	-	-	129

Dimensions not binding – DN = DIN 11851 male threaded connection – exec. with standard IEC/EN motors

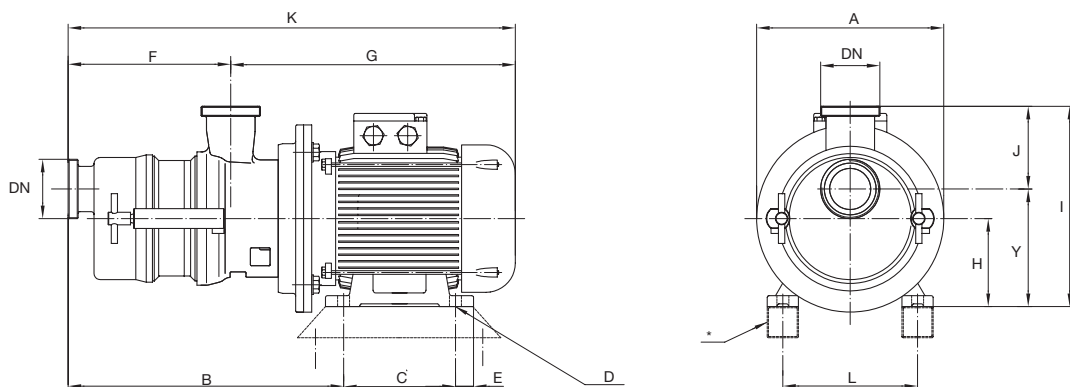
13.3 AS 42-52 with shroud 1450 rpm



Pumps	kW	DN	A	B	C	C1	E	E1	F	G	K	H	J	I	I1	Y	L	L1	Weight kg
AS 42	2,2	40	298	220	-	231	-	203	205	520	725	190	110	335	354	225	225	-	56
	3	40	298	220	-	231	-	203	205	520	725	190	110	335	354	225	225	-	60
AS 52	5,5	50	370	258	292	-	267	-	237	580	817	230	115	381	417	266	225	-	85

Dimensions not binding – DN = DIN 11851 male threaded connection – exec. with standard IEC/EN motors

13.4 AS 42-52 with shroud 1450 rpm



Pumps	kW	DN	A	B	C	D	E	F	G	K	H	J	I	Y	L	M	N	O	Weight kg
AS 42	2,2	40	250	365	140	12	18	200	416	616	100	110	245	135	160	-	-	-	51
	3	40	250	365	140	12	18	200	416	616	100	110	245	135	160	-	-	-	55
AS 52	5,5	50	300	454	140	12	20	237	502	739	132	115	283	168	216	-	-	-	77

Dimensions not binding – DN = DIN 11851 male threaded connection – exec. with standard IEC/EN motors

14.0 Trouble shooting chart

The pump does not prime

- Air has entered the suction piping; check the seals on the fittings and tighten them sufficiently.
- Suction pipe not submerged in liquid.
- Clearances between impeller/cover and impeller/body have increased. Check and correct.
- No liquid in the pump. Introduce liquid.
- Reduce loss of suction head; reduce the suction height.
- Formation of air pockets; eliminate and if necessary fit a valve on discharge.

No flow

- Pump not primed; (see point 8 and previous point).
- Pump turning in wrong direction.
- Suction port obstructed.
- On-off valves closed.

Insufficient flow

- Increased system back pressure on discharge side; increase piping diameter.
- Air entering mechanical seal; check its condition.
- Viscosity of fluid greater than that specified in the order. Contact manufacturer.
- Clearances between impeller/cover and impeller/body have increased. Check and correct.

Loss of head

- Back pressure on discharge side has fallen; throttle the suction pipe.
- Clearances between impeller/cover and impeller/body have increased. Check and correct.

Increase in absorbed power

- Flow rate is lower than required.
- Pump is turning at higher speed.
- The impeller does not turn freely. Check it.
- Viscosity and/or specific weight are higher than stated.
- Bearings are not in good condition.

Increase in absorbed current

- The power required has increased (see previous point).
- Main voltage value has fallen.
- There is a fault in the electrical system.

15.0 Disposal of the pump

For disposing the pump please observe the following instructions:

- Disconnect electrical and hydraulic connections according to technical rules and laws in force.
- Disassemble all components of the pump for separate dismantling; wash the components and clean the structure accurately.

The main components of the pump are made from the following materials:

- Pump casing, cover,

impeller,	}	S.S. AISI 316L
shaft, impeller nut		
- Elastomeres NBR, EPDM, Viton, Teflon
- Motor Aluminium, Cast iron, Copper

Components made from amianthus or lead are not used in our production.

The components of the pump should be properly disposed of, according to the corresponding rules in force in receiver's country.

Johnson Pump Industry Group

National Sales Organisations

AUSTRALIA

Johnson Pump (Australia) Pty. Ltd.
Tel. +61 (0)7 3899 9933
Fax +61 (0)7 3899 8574

BELGIUM

Johnson Pump N.V./S.A.
Tel. +32 (0)2 422 15 50
Fax +32 (0)2 422 15 59

DENMARK

Johnson Pumper A/S
Tel. +45 43 52 24 00
Fax +45 43 52 15 77

FINLAND

Johnson Pump Oy
Tel. +358 (0)9 348 3800
Fax +358 (0)9 348 38495

FRANCE

Johnson Pompes
Tel. +33 (0)1 39 20 50 00
Fax +33 (0)1 39 56 54 22

GERMANY

Johnson Pumpen GmbH
Tel. +49 (0)5731 480 80
Fax +49 (0)5731 414 00

ITALY

Johnson Pump Italiana S.r.l.
Tel. +39 039 604 14 63
Fax +39 039 604 90 97

NETHERLANDS

Johnson Pump B.V.
Tel. +31 (0)592 37 67 67
Fax +31 (0)592 37 67 06

Johnson Pump Horticulture
Tel. +31 (0)174 51 84 10
Fax +31 (0)174 51 84 44

NORWAY

Johnson Pump Norway
Tel. +47 22 74 08 40
Fax +47 22 22 70 30

SPAIN

Johnson Pump España, S.L.
Tel. +34 972 58 08 01
Fax +34 972 58 08 03
Sales Office:
Madrid: Tel. +34 91 888 79 22

SWEDEN

Johnson Pump Svenska AB
Tel. +46 (0)19 21 83 70
Fax +46 (0)19 27 23 18

SWITZERLAND

Johnson Pumpen AG
Tel. +41 (0)43 477 71 22
Fax +41 (0)43 477 71 20

UNITED KINGDOM

JP Pumps Ltd.
Tel. +44 (0)1293 55 34 95
Fax +44 (0)1293 52 46 35
Northern Regional Office:
Bradford: Tel. +44 (0)1274 74 56 10
Fax +44 (0)1274 74 56 11

Business Units

BELGIUM

Johnson Pump Brussels N.V.
Tel. +32 (0)53 60 27 15
Fax +32 (0)53 60 27 01

INDIA

Johnson Pump (India) Ltd.
Tel. +91 (0)79 287 03 11
Fax +91 (0)79 287 25 22

NETHERLANDS

Johnson Pump Water B.V.
Tel. +31 (0)592 37 67 67
Fax +31 (0)592 37 67 60

SWEDEN

Johnson Pump Industry AB
Tel. +46 (0)19 21 83 00
Fax +46 (0)19 27 23 72

www.johnson-pump.com



JOHNSON PUMP

Johnson Pump Industry AB

